received
1-26-15

2015 Neighborhood Improvement Program Grant Application

(Deadline, Wednesday, February 4, 2015)

Neighborhood Group: Champion Greens Date: January 25, 2015

Project Title: Replacement of Irrigation Controllers and Supporting Components

Project Location: Designated Locations throughout the Champion Greens neighborhood. Please see attached map.

Amount requested: $6,000 Grant #

NIP Grants applied for or awarded in the last three years:

2012 – Applied for: No Grant awarded? No Amount Awarded? $ 0

2013 – Applied for: No Grant awarded? No Amount Awarded? $ 0

2014 – Applied for: Yes Grant awarded? Yes Amount Awarded? Champion Greens received a $10,000 portion of the Flood Recovery dollars.

Is your neighborhood a voluntary neighborhood or a HOA? HOA

4. Identify the need or problem your neighborhood has recognized and is prepared to address.

(Value 0 to 4 points), based on how compelling this need is – 0 not compelling, 1 somewhat compelling, 2 compelling, 3 very compelling, 4 extremely compelling.

Champion Greens is one of the four communities in Longmont that was devastated by the historic 1,000 year flood on September 12th of 2013. Eighty six of the 88 homes here had sewage and muddy water filling our basements. Some homes had levels rising to the ceilings of their

basements. Power was lost for five days and residents were evacuated during that period of time. Sprinkler clocks and supporting components were completely submerged all those days and when access was finally attained, it was clear that a number of problems had become apparent. They include damaged displays on controllers, zone valve boxes full of sludge and sediment which promoted wire oxidation and corrosion, inactive zones due to corroded wire splices, spray heads and nozzles with a small orifice or tight filtration clogged at extremities, ground shifting causing poly lateral pipes to flex and leak in areas and sprinkler heads to pitch over, and intermittent operation or "ghosting" of controllers resulting in sprinklers turning on and off during the day and night regardless of programming. This last issue is particularly terrifying to homeowners here. Imagine hearing the sound of water gushing from somewhere as you're trying to sleep at night and when you investigate, you see that your window wells are filling with water which is entering your home – again – just like it did in September 2013. It feels like you're reliving the trauma of that catastrophic flood once more.

When homeowners moved into this neighborhood, we were informed by the builder that our houses were built upon what was probably the bottom of a river or lake bed with rocks just below the surface of the grass. Drilling down three stories, fossilized palm fronds were found indicating that this area was submerged at one point in time. Today, the rocks from the lake bed are just below the surface of our sod. The water audit noted that the average root depth of grass in our community is 4.4 inches, significantly below the recommended range of 6 to 12 inches. This was no surprise to us because we know that to try to plant anything here, a pick ax is required to get through the rocks. This rocky soil structure has left the irrigation system prone to water leaks from scraped or punctured pipes as the ground shifts from walking on it and from the regular rumbling of lawn maintenance equipment. This has been an ongoing problem in our community since its inception, but the catastrophic flood of 2013 exacerbated these issues. As a result, although infrequent, it is not unusual for us to experience enormous leaks, and, on occasion, hundreds of thousands of gallons of water are lost.

All of the irrigation controllers in our neighborhood are the original ones from when our community was built almost twenty years ago. As a result of wear and tear from being imbedded in our rocky soil and particularly following the flood, these components are beyond repair and are in desperate need of

replacement. Controllers "E", "F", and "G" are in the worst condition at this time. These are the ones we would like to replace this year. Their locations are depicted on the attached map.

5. How did you involve your neighborhood in identifying this need or problem?

(Value 0 to 4 points), based on the level that the neighborhood was involved in identifying this need or problem -0 not involved, 1 somewhat involved, 2 involved, 3 very involved, 4 extremely involved.

The NGLA grant process was discussed at both our quarterly HOA meeting on September 4, 2014 and our annual HOA meeting on December 4, 2014. We spoke about other needs in our community, but addressing the sprinkler problems was at the top of the list. This issue received unanimous support throughout our community.

6. Describe how the project will provide a solution that is sustainable to the problem stated above.

(Value 0 to 4 points), based on how this will provide a sustainable solution to the need or problem – 0 poor solution, not sustainable, 1 an OK solution, not very sustainable, 2 a good solution, sustainable, 3 very good solution, and sustainable, 4 very good solution, and very sustainable.

The desired conservation outcome is to save water, time, and money. The water audit recommends that Champion Greens fix the leaks in the clocks and install check valves to reduce water loss. The clocks currently in place are beyond repair. Replacing the existing controllers with units that feature flow sensors which detect main line and lateral breaks, leaks, and broken heads will result in automatic shutdown to the area in which the breaks occur thus saving us valuable water, time, and money. Further, present technology provides watering options that auto-adjust based on temperature, humidity, rain, freezing conditions, seasonal variations, and soil, plant, and sprinkler type. They allow for data collection, report generation, system alerts, computer management of the system, and elimination of the need to have the irrigation specialist race to the scene to be physically present on the property. This will not only conserve water but will also prevent expensive service calls from the irrigation specialist. All of

these features will help us significantly reduce water, time, and money. As stated, this project replaces existing controllers and supporting components and does not maintain the existing ones. No backflow devices will be changed so permits are not required.

7. What is the contribution to this project from neighborhood (money/materials/labor)?

(Value 0 to 6 points), based on the contribution from the neighborhood – 0 poor contribution, 1 an adequate contribution, 2 a good contribution, 3 very good contribution, 4 excellent contribution, 1 extra point for a non HOA neighborhood, an additional extra point for a non HOA neighborhood that has a contribution of 25% or greater.

We are requesting $6,000 through the NGLA program. We are prepared to contribute $7,000 toward the installation of this system and we plan to spend additional dollars each year for a continued maintenance program administered by a professional irrigation specialist. The first year in particular following this type of infrastructure change requires some fine tuning and data collection in order to accurately define values in the controller programming which will save us water, time, and money. Designating funds for this work is a regular part of our operating budget each year.

8. The NIP Grant is funded by the Public Improvement Fund and must provide a clear public benefit. Describe how this project will benefit the public.

(Value 0 to 6 points), based on how this will provide a clear benefit to the public – 0 - 1 poor benefit, 2 – 3 an OK benefit, 4 – 5 a good benefit, 6 – 7 very good benefit, 8 – 10 excellent benefit.

Champion Greens is not a gated community. Everyone is welcome to drive through or walk around our neighborhood and those who choose to do so will find a markedly improved sprinkler system that does not waste water or turn on unexpectedly. Grass and shrubs will be watered more uniformly eliminating dried sections and soggy areas. Water conservation should be a top priority for every citizen of our city.

2015
Neighborhood Improvement Program
Project Intent

COMMUNITY SERVICES
COMMUNITY & NEIGHBORHOOD RESOURCES
GET MORE FROM LIFE

Neighborhood Group: Champion Greens Date: September 23, 2014

Due date: **PLEASE COMPLETE AND RETURN THIS FORM BY 5:00 PM ON SEPTEMBER 24, 2014**

Project Title: Replacement of Irrigation Controllers and Supporting Components

Project Location: Designated Locations throughout the Champion Greens neighborhood. Please see attached map.

Amount requested: $6,000

Project Description:

Champion Greens is one of the four communities in Longmont that were devastated by the historic 1,000 year flood on September 12th of last year. Eighty six of the 88 homes here had sewage and muddy water filling our basements. Some homes had levels rising to the ceilings of their basements. Power was lost for five days and residents were evacuated during that period of time. Sprinkler clocks and supporting components were completely submerged all those days and when access was finally attained, it was clear that a number of problems had become apparent. They include damaged displays on controllers, zone valve boxes full of sludge and sediment which promoted wire oxidation and corrosion, inactive zones due to corroded wire splices, spray heads and nozzles with a small orifice or tight filtration clogged at extremities, ground shifting causing poly lateral pipes to flex and leak in areas and sprinkler heads to pitch over, and intermittent operation or "ghosting" of controllers resulting in sprinklers turning on and off during the day and night regardless of programming. This last issue is particularly terrifying to homeowners here. Imagine hearing the sound of water gushing from somewhere as you're trying to sleep at night and when you investigate, you see that your window wells are filling with water which is entering your home – again – just like it did last year. It feels like you're reliving the trauma of that catastrophic flood once more.

When homeowners moved into this neighborhood, we were informed by the builder that our houses were built upon what was probably the bottom of a river or lake bed with rocks just below the surface of the grass. Drilling down three stories, fossilized palm fronds were found indicating that this area was submerged at one point in time. Today, the rocks from the lake bed are just below the surface of our sod. The water audit noted that the average root depth of grass in our community is 4.4 inches, significantly below the recommended range of 6 to 12 inches. This was no surprise to us because we know that to try to plant anything here, a pick ax is required to get through the rocks. This rocky soil structure has left the irrigation system prone to water leaks from scraped or punctured pipes as the ground shifts from walking on it and from the regular rumbling of

lawn maintenance equipment. This has been an ongoing problem in our community since its inception, but the catastrophic flood last year exacerbated these issues. As a result, although infrequent, it is not unusual for us to experience enormous leaks, and, on occasion, hundreds of thousands of gallons of water are lost.

All of the irrigation controllers in our neighborhood are the original ones from when our community was built almost twenty years ago. As a result of wear and tear from being imbedded in our rocky soil and particularly following the flood, these components are beyond repair and are in desperate need of replacement. Controllers "E", "F", and "G" are in the worst condition at this time. These are the ones we would like to replace this year. Their locations are depicted on the attached map.

Will this project impact, or is any part of it in City parks and/or right-of-way (ROW)? Yes ☐ No X
If yes, provide a description of impact and/or placement in City parks or ROW. Please attach a map.

- **If no, attach a map showing the location on private property.**

Is electricity needed? Yes ☐ No X

- **If yes describe the electrical components of this project**

Is this an irrigation project? Yes X No ☐

A grant requesting any improvements to an irrigation system must have an independent water audit and include audit with the Project Intent. The audit must define a need for conservation and a strategy for how this grant will meet that conservation need.

1. **Independent water audit attached? Yes X No ☐ (grant request will not be considered without audit)**
2. **What is the desired conservation outcome and where is that identified in the audit?**
3. **How will this project meet those conservation needs?**
4. **NIP grants cannot be used for maintainance, explain why this is new infrastructure and not maintainance to an existing system.**

The desired conservation outcome is to save water, time, and money. The water audit recommends that Champion Greens fix the leaks in the clocks and install check valves to reduce water loss. The clocks currently in place are beyond repair. Replacing the existing controllers with units that feature flow sensors which detect main line and lateral breaks, leaks, and broken heads will result in automatic shutdown to the area in which the breaks occur thus saving us valuable water, time, and money. Further, present technology provides watering options that auto-adjust based on temperature, humidity, rain, freezing conditions, seasonal variations, and soil, plant, and sprinkler type. They

allow for data collection, report generation, system alerts, computer management of the system, and elimination of the need to have the irrigation specialist race to the scene to be physically present on the property. This will not only conserve water but will also prevent expensive service calls from the irrigation specialist. All of these features will help us significantly reduce water, time, and money.

As stated, this project replaces existing controllers and supporting components and does not maintain the existing ones. No backflow devices will be changed so permits are not required.

Are permits needed for this project? Yes ☐ No X

- **Describe what permits are needed for this project**

Are any other City resources needed? Yes ☐ No X

- **Describe what additional resources may be needed from the City to complete this grant**

Describe the ongoing maintenance that this project requires and provide the plan to support that maintenance.
Provide names and addresses of maintenance contacts (attach additional pages if necessary)

A continued maintenance program from a professional irrigation specialist is necessary given the delicate nature of the system here at Champion Greens. The first season in particular following this type of infrastructure change requires some fine tuning and data collection in order to accurately define values in the controller programming which will save us water, time, and money. Designating funds for this work is a regular part of our operating budget each year.

2015
Neighborhood Improvement Program
Budget

Neighborhood Group: Champion Greens Date: September 23, 2014

Project Title: Replacement of Irrigation Controllers and Supporting Components

Project Budget

Materials/Vendors/Installation:	Request	Match
_____	$ 4,900	$ 5,700

Controllers
Flow sensors
Wiring modules
Processors
Master valves
14 gauge single strand wire

Services:

_____		
_____		
___40____hours @ $___60_____/hour =	$ 1,100	$ 1,300
_____		
_____		
_____hours @ $_____/hour =	$ _____	$ _____
City Staff Time needed as determined by PW&NR		
_____hours @ $_____/hour =	$ 0	$ 0
TOTAL	$ 6,000__	$ 7,000

TOTAL PROJECT COST INCLUDING MATCH **$13,000**

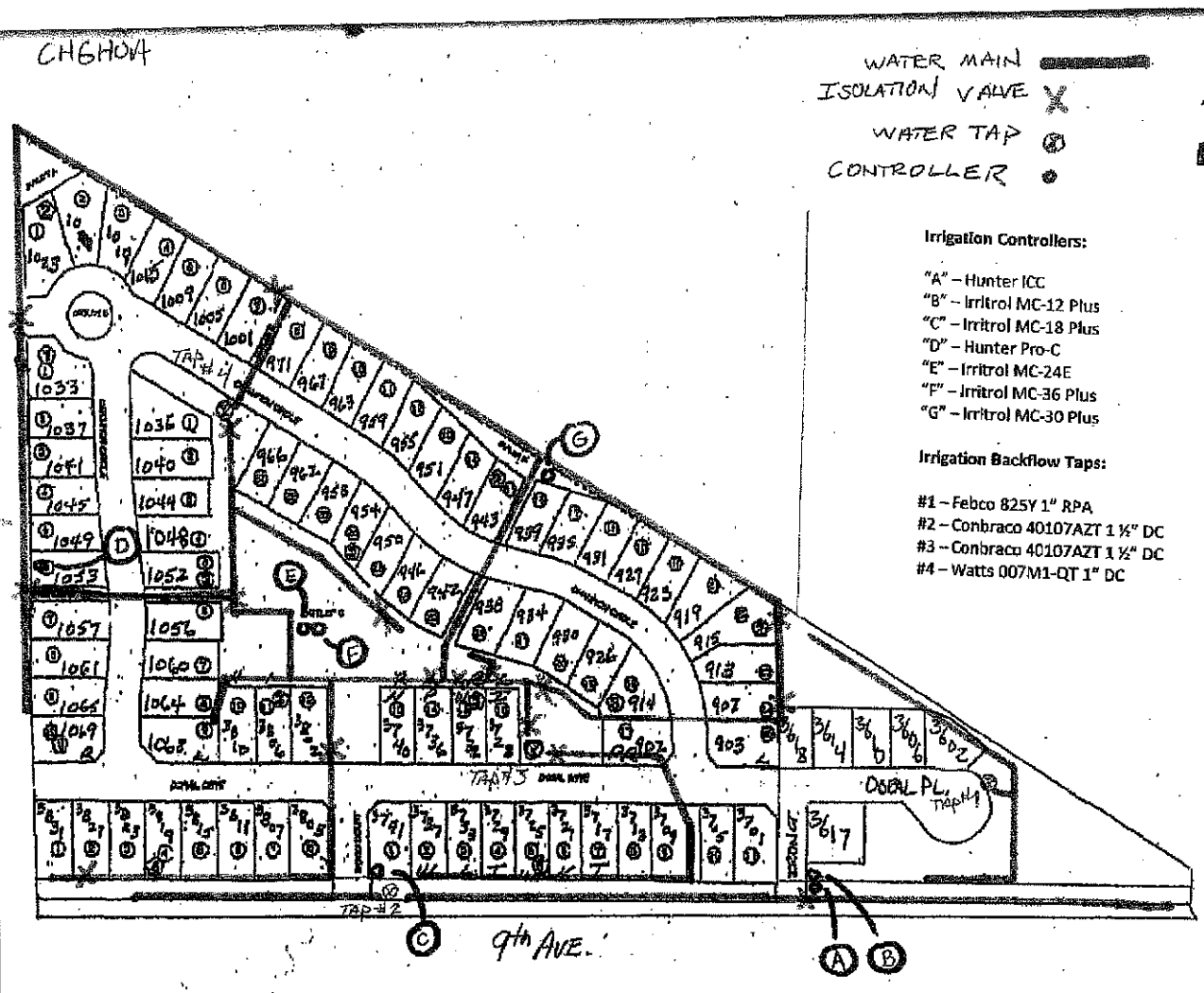
PERCENT OF TOTAL (Match/Request) 46% 54%

Estimated Annual Maintenance Costs: __Included in our budget each year

Project Cost Estimate Developed by:

(Project approval/City staff sign off, and renewal costs to be calculated by City Staff)

CH6H04


WATER MAIN
ISOLATION VALVE
WATER TAP
CONTROLLER
N
Irrigation Controllers:
"A" – Hunter ICC
"B" – Irritrol MC-12 Plus
"C" – Irritrol MC-18 Plus
"D" – Hunter Pro-C
"E" – Irritrol MC-24E
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Irrigation Backflow Taps:
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#4 – Watts 007M1-QT 1" DC
TAP #1
TAP #2
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TAP #4
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A
B
C
D
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F
G

2015
Neighborhood Improvement Program
Project Intent

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SEP24 4:51PM

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Names and addresses of maintenance contacts include:

Aaron Sall, CLIA, CLTI, Ideal Irrigation, llc, 970-402-9799, aaron@idealirrigation.net

Bob Danos,, Property Manager, PML, Inc., 1155 South Main Street, Longmont, CO 80501, 303-772-5934, rmdpml@yahoo.com

Anna Sauer, President of the HOA, 1045 Champion Circle, Longmont, CO 80503, 303-678-9471, asauer0328@aol.com

2015
Neighborhood Improvement Program Budget

Neighborhood Group: Champion Greens Date: September 23, 2014

Project Title: Replacement of Irrigation Controllers and Supporting Components

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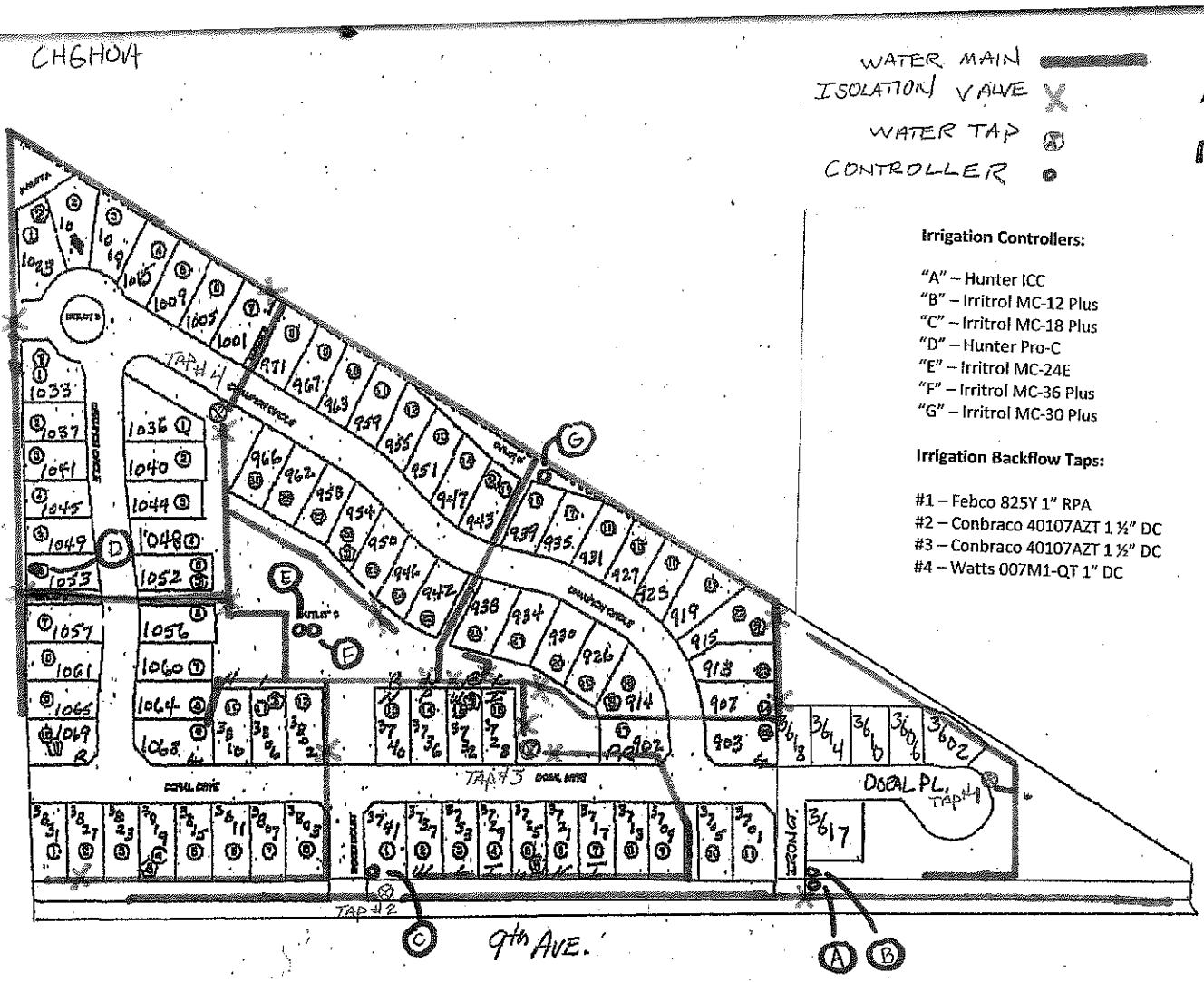
CH6HOA


WATER MAIN
ISOLATION VALVE
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TAP #1
TAP #2
TAP #3
TAP #4
DOBAL PL.
9th AVE.
A
B
C
D
E
F
G

CENTER FOR ReSource CONSERVATION

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303-999-3820
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Irrigation Inspection Report
Champion Greens
Longmont CO. 80501

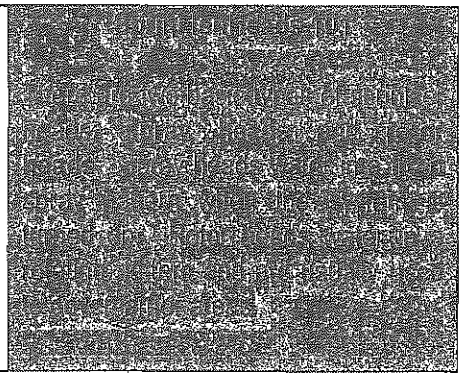
Executive Summary

This report contains a summary and the results of an irrigation inspection performed at Champion Greens on Monday July 30, 2012. Matt Hoenecke and Peter Niedbalski with the Center for ReSource Conservation (CRC) performed the inspection through the CRC's Slow the Flow Irrigation Inspection Program. The CRC is a non-profit organization that empowers our community to conserve natural resources. The city of Longmont has partnered with the CRC to offer this service to their customers in an effort to maximize irrigation efficiency and reduce water use.

Procedure

We performed the following steps as part of the inspection:

- Met with Susan Carr, President of Champion Greens; Bob Danos, Management of PML; Aaron Saul, Sprinkler Technician
- Visually inspected 112 zones of the property
- Performed catch cup tests
- Performed pressure tests
- Performed soil and root depth tests
- Calculated a customized watering schedule



Test Results and Findings

We found the sprinkler system at Champion Greens to be in good condition. The pressure seemed suitable, and the overall design is efficient. There was one major leak due to a missing head on Clock A, Zone 3. Clock A also had some zones with overspray. There were several sunken and tilted heads throughout the HOA, but the problems were mild considering the size of the property.

We tested the distribution uniformity (DU), operating pressure, soil type, and root depth in ten areas. We found an average DU of 63% and a range of to 45% to 82% for all zones tested. We recommend correcting the system so that all zones perform with a DU value of at least 70%.

We found an average pressure of 35 PSI on spray zones and 45 PSI on rotor zones. The design pressure for spray heads ranges from 20 to 30 PSI; for rotor heads it ranges from 25 to 80 PSI. You can add more heads to a zone to reduce pressure, but the pressure does not seem overly high.

We found that most of your soil is clay and that you have an average grass root depth of 4 inches.

Distribution Uniformity

Distribution Uniformity (DU) is a measure of how evenly your sprinkler system waters a given area. It is measured as a percentage.

DU impacts the health and appearance of your turf. For example, if an area has a distribution uniformity of 50%, that means some parts of it are receiving half as much water as the rest of the area. If the watering schedule is set to give an appropriate amount of water to the areas with good coverage, the areas receiving poor coverage will look poor. If the watering schedule is set to give an appropriate amount of water to the areas receiving the least water, the area as a whole will receive twice as much water as it needs. We recommend a minimum distribution uniformity of 70% for all zones.

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During the visual inspection and testing, we found the following problems on the sprinkler system:

- Leak on Clock A, Zone 3; possible leak on Clock G, Zone 7
- Sunken and tilted heads
- Broken nozzles
- Overspray

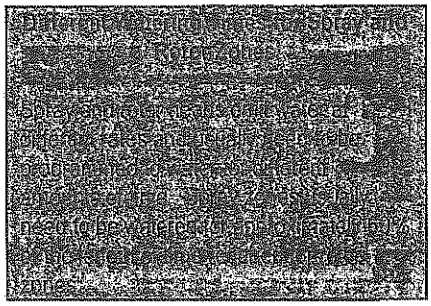
Based on the test results and our findings, we recommend that Champion Greens take the following steps:

- Fix the leaks on Clock A and Clock G
- Raise tilted and sunken heads, especially in zones with low DU
- Use check valves in sloped areas to reduce water loss and prevent water from flowing onto the street
- Adjust radius screw in areas with overspray

Watering Schedule

In the body of the report, we have provided watering schedules for zones on which we performed catch cup tests. We base our watering schedules on evapotranspiration (ET), the amount of water the grass and soil lose to evaporation and transpiration each year. We use a historical average ET of 27 inches per watering season to determine our schedules.

In general, we found that the current watering schedule is similar to our recommendations for spray zones and rotor zones. However, some zones were significantly overwatered. While this might appropriate for the peak temperature days, they should be reduced as fall draws closer. To avoid encouraging over-watering, we did not supply an irrigation schedule for zones with a distribution uniformity of less than 40%.



Conclusion

Thank you for your participation in Slow the Flow Colorado. We hope that the data and recommendations in this report will help you maintain a beautiful landscape while using water as efficiently as possible. If you have any questions, please feel free to contact our Program Manager at 303-999-3820 x 210.

Matt Hoenecke and Peter Niedbalski
Slow the Flow Colorado
Center for ReSource Conservation

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Full Report

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Inspection Procedure

Upon arrival at Champion Greens, we met briefly with Susan Carr, who is the HOA president responsible for managing the property. After meeting with Susan, we performed the following steps of an inspection:

- Visual Inspection. We inspected all sprinkler heads within 112 zones on the property. During the visual inspection, we observed the zones as they operated, looked for problems, and recorded what we observed.
- Catch Cup Tests. We chose ten areas on the property to perform catch cup tests. For each test, we laid out a set of catch-cups in a grid pattern on the turf and recorded the amount of water that fell in each cup during a specified period of time. This gave us a measure of how evenly the sprinkler system waters in each area, called *distribution uniformity*, and a measure of how quickly the system waters, called *precipitation rate*.
- Pressure Tests. We measured the operating pressure of the sprinkler system in each area where we performed catch cup tests. We compared the observed pressure to the recommended operating pressure for each head type.
- Soil and Root Depth Tests. We took a soil sample in each test zone to determine soil type and root depth.
- Determine a Customized Watering Schedule. We used the precipitation rate and the soil type in each tested zone to determine a customized watering schedule for that zone. These watering schedules are included in this report.
- Written Report. After leaving the site, we wrote this report of our results.

Site Description

Champion Greens is a Homeowners Association that has a considerable amount of turf on the perimeter and park areas. The irrigation system has 7 controller clocks with an average of 17 to 20 zones per controller. Most of the clocks were Irritrol MC models, but there were also a few Hunter XC clocks. Most zones were watered 3 to 4 times a week, 2 cycles per day, for approximately 10 to 15 minutes. The majority of the walkway areas were spray zones, while the central park area was rotor zones.

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Findings

Issues Needing Immediate Attention
There was one major leak from a missing head on Clock A, Zone 3.

General Findings

Spray Zones	Distribution Uniformity (%)	Precipitation Rate (in./hour)	Root Depth (inches)
Average	0.63	1.74	4
Range	0.45-0.78	1.2-2.1	2+-6

Rotor Zones	Distribution Uniformity (%)	Precipitation Rate (in./hour)	Root Depth (inches)
Average	0.754	1.249	4.4
Range	0.72-0.82	0.66-1.905	3-6

We recommend that the irrigation system be corrected to perform at a minimum 70% distribution uniformity for all zones. To avoid overwatering, we did not supply an irrigation schedule for zones with a distribution uniformity of less than 40%.

We found grass root depths of 2 to 6 inches, which are mostly lower than our recommended 6 to 12 inch range. We encourage deep roots as they help grass resist disease and drought.

We found soil types of mostly clay, with some loam. We used the soil type and precipitation rate found in each zone to determine a customized watering schedule for that zone.

	Rotor Pressure	Spray Pressure
Average	41.6	35.6
Range	21-60	25-45

Depending on the brand and model, the design pressure for rotor heads ranges from 25 to 80 PSI. The design pressure for spray heads ranges from 20 to 30 PSI.

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The design of the irrigation system at Champion Greens is efficient and spaced well. Besides one major leak, the turf was in excellent condition. Overspray was minimal due to correct adjustments and head choice. Most clocks used a two cycle schedule, which is sufficient for a large area. The pressure is high in some places but is not a major concern in general. Distribution uniformity was mostly high, but we recommend raising tilted and sunken heads in areas with low DU. Other problems observed at Champion Greens are summarized below.

Problems Found

Leaks
Clock A, Zone 3 has a missing head which is causing a significant leak. Clock G, Zone 7 may have a leak as well.

Misaligned, Clogged, Blocked, Sunken, and Tilted Heads
Many of the heads were misaligned, clogged, blocked, sunken, and/or tilted. Over time, heads tend to sink and tilt due to the natural settling of the earth and wear-and-tear from foot traffic and lawn maintenance. Although they are still operational, these heads often do not spray water onto the turf or spray in undesirable patterns. These seemingly minor issues have the potential to greatly reduce the efficiency of the system, resulting in overspray, brown spots, misting, and wasted water. These problems are relatively easy and inexpensive to fix, and correcting them can dramatically increase the system's efficiency. Raise and level all heads to the ground surface and unclog or unblock affected heads. The spray from each head should be able to clear the grass when it is at its tallest.

Overspray
Some of the heads on the property were spraying onto sidewalks and other hardscapes. To avoid overspray, heads should be placed several inches away from the edge of the landscape. To reduce the throw radius of a sprinkler head up to 20%, the radius adjustment screw should be utilized. If the radius needs to be reduced more than 20%, a nozzle with a shorter throw radius should be installed.

Check Valves
After the system was turned off, water continued to run out of the heads located at the lower end of the zone. This was because the water left in the system was draining. It is possible to prevent this by installing heads that have check valves. Check valves seal off the sprinkler heads when the zone is shut off, keeping water in the pipes. Check valves not only eliminate the loss of water from the system, but also prevent excess wear on the system's pipes. Most sprinkler heads can be retrofitted with check valves.

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Visual Inspection Notes

Zone Number	Type: (Spray, Rotor, or Drip)	Brand and Model	Inspection Notes
Clock A: Hunter ICC located at the corner of Iron Ct near entrance way; controls 23 zones near retention pond and houses near Iron Ct			
1	R	Hunter PGJ	3 blocked heads/adjustment screw
2	R	Hunter PGJ	1 blocked head
3	R	Hunter PGJ	Major leak, missing head
10	S	Rainbird 1800	A few tilted heads
16	S	Rainbird 1800	3 sunken heads
18	S	Rainbird 1800	A few tilted heads, 1 sunken head
20	S	Rainbird 1800	A few titled heads
21	S	Rainbird 1800	Sunken heads
Clock B: Irritrol MC-12+ located near the corner of Iron Ct near entrance way; controls 7 zones			
2	S	Rainbird 1800	A few sunken heads, but good coverage
3	S	Rainbird 1800	Sunken heads, but good coverage
5	S	Rainbird 1800	Sunken heads
6	S	Rainbird 1800	Tilted heads
7	S	Rainbird 1800	Sunken heads
Clock C: Irritrol MC located near second entrance; controls 15 zones			
3	S	Rainbird 1800	A few tilted heads, slight overspray
5	S	Rainbird 1800	A couple sunken heads
8	S	Rainbird 1800	Sunken and tilted heads
9	R	Hunter PGJ	Adjustment screw
10	S	Rainbird 1800	Sunken and tilted heads
12	S	Rainbird 1800	Tilted heads, overspray
14	S	Rainbird 1800	Sunken heads
Clock D: Hunter ICC located at 1053 Champion Circle; controls 5 zones			
1	S	Rainbird 1800	Tilted heads
2	S	Rainbird 1800	Sunken, tilted heads
4	R	Hunter PGJ	Mp rotors, good coverage

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Clock E: Irritrol MC-36, left unit in park; controls 19 zones			
4	S	Rainbird 1800	Sunken heads
5	S	Rainbird 1800	Check valves could be installed
6	S	Rainbird 1800	Overspray, check valves
7	S	Rainbird 1800	2 sunken heads
9	S	Rainbird 1800	Cracked nozzle
10	S	Rainbird 1800	Low pressure ,sunken heads
14.	R	Hunter PGJ	A few sunken heads
Clock F: Irritrol MC-36, right unit in park			
1.	S	Rainbird 1800	A few sunken heads
2	S	Rainbird 1800	A few tilted heads
3	S	Rainbird 1800	Sunken heads
4	S	Rainbird 1800	Tilted and sunken heads
5	S	Rainbird 1800	Sunken heads, slight overspray
7	S	Rainbird 1800	A few tilted heads
10	R	Hunter PGJ	A few sunken
14	R	Hunter PGJ	A few sunken
Clock G: Irritrol MC-36, 939 Champion Circle; controls 16 zones			
5	S	Rainbird 1800	A few sunken and tilted heads
7	S	Rainbird 1800	Leak, low pressure, sunken heads
9	S	Rainbird 1800	A few tilted and sunken heads
10	S	Rainbird 1800	Sunken heads
11	S	Rainbird 1800	Sunken and tilted heads

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Test Results

	Area 1 Rotor Zone	Area 2 Rotor Zone
Clock ID	F	G
Zone Numbers	14	4
Root Depth (inches)	3+	4+
Soil Type	Clay	Clay
Head Brand	Hunter	Hunter
Head Model	PGJ	PGJ
Head Pressure (PSI)	40	60
PR (inches/hr)	0.66	1.04
DU (%)	78%	71%
Current Minutes/Week	140	88
Rec. Minutes/Week	96	60

	Area 3 Spray Zone	Area 4 Rotor Zone
Clock ID	G	F
Zone Numbers	9	9
Root Depth (inches)	2+	6
Soil Type	Clay	Clay
Head Brand	Rainbird	Hunter
Head Model	1800	PGJ
Head Pressure (PSI)	42	55
PR (inches/hr)	1.2	1.095
DU (%)	45%	82%
Current Minutes/Week	46	160
Rec. Minutes/Week	48	54

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	Area 5 Rotor	Area 6 Spray Zone
Clock ID	A	A
Zone Numbers	10	24
Root Depth (inches)	4+	4+
Soil Type	Clay	Clay/loam
Head Brand	Hunter	Rainbird
Head Model	PGJ	1800
Head Pressure (PSI)	32	25
PR (inches/hr)	0.86	1.7
DU (%)	75%	69%
Current Minutes/Week	108	36
Rec. Minutes/Week	39	36

	Area 7 Spray Zone	Area 8 Spray Zone
Clock ID	B	C
Zone Numbers	4	15
Root Depth (inches)	6+	5+
Soil Type	Loam/thatch	Clay
Head Brand	Rainbird	Rainbird
Head Model	1800	1800
Head Pressure (PSI)	39	45
PR (inches/hr)	1.9	2.1
DU (%)	65%	60%
Current Minutes/Week	128	64
Rec. Minutes/Week	30	30

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	Area 9 Spray Zone	Area 10 Rotor Zone
Clock ID	D	D
Zone Numbers	2	4
Root Depth (inches)	4+	5+
Soil Type	Loam	Loam
Head Brand	Rainbird	Hunter
Head Model	1800	PGJ
Head Pressure (PSI)	27	21
PR (inches/hr)	1.8	0.89
DU (%)	78%	71%
Current Minutes/Week	60	120
Rec. Minutes/Week	36	72

Watering Schedules

We base our watering schedule on evapotranspiration (ET). ET is the amount of water the plants and soil lose to evaporation and transpiration each year. It is the amount of water a plant needs to survive. We base our recommended schedule on an average historical ET rate for bluegrass in the Denver area, which is **27 inches per year**. Our schedules are designed to put this amount of water back into the landscape during the watering season. Please keep in mind that 27 inches per year is a historical average; if the weather is significantly hotter and drier or cooler and wetter than average, you may need to adjust your watering schedule.

Cycle and Soak

Watering in short cycles, or "cycling," is important if your landscape has heavy clay soils, significant slopes, or if your sprinklers have a high precipitation rate. For most systems, we suggest dividing watering times into two or three cycles with roughly one hour between each cycle. This gives the soil time to absorb the water applied during one cycle before the next begins. Cycling helps prevent runoff and gives your turf a deeper watering, which encourages deeper root growth. On most control clocks, the "multiple start times" feature can be used to implement a cycle-and-soak schedule.

Recommended Watering Schedule

We recommend using this watering schedule as a GUIDE during non-restrictive years. We have provided schedules for zones on which we performed catch cup tests. You may use these schedules as a base for watering other zones that have similar precipitation rates (those with the same head type and a similar design). We recommend adjusting this schedule to account for varying environmental factors, such as sun exposure, in different zones.

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We do not recommend drastically changing watering times in a short period of time. This will stress the turf significantly. If our recommended watering schedules are significantly different than the current watering schedule, we suggest slowly reducing the current watering time to ease the turf into the new schedule.

Recommended Schedules

Clock: F		Zone: 14		Zone Type: Rotor	
Current minutes/week: 140		Recommended minutes/week: 96			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	16	48	72
June-August	2	3	16	48	96
September	1	3	16	48	48

Clock: G		Zone: 4		Zone Type: Rotor	
Current minutes/week: 88		Recommended minutes/week: 60			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	10	30	45
June-August	2	3	10	30	60
September	1	3	10	30	30

Clock: G		Zone: 9		Zone Type: Spray	
Current minutes/week: 46		Recommended minutes/week: 48			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	8	24	36
June-August	2	3	8	24	48
September	1	3	8	24	24

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Clock: F		Zone: 9		Zone Type: Rotor	
Current minutes/week: 160		Recommended minutes/week: 54			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	9	27	40.5
June-August	2	3	9	27	54
September	1	3	9	27	27

Clock: A		Zone: 10		Zone Type: Rotor	
Current minutes/week: 108		Recommended minutes/week: 78			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	13	39	58.5
June-August	2	3	13	39	78
September	1	3	13	39	39

Clock: A		Zone: 24		Zone Type: Spray	
Current minutes/week: 36		Recommended minutes/week: 36			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	6	18	27
June-August	2	3	6	18	36
September	1	3	6	18	18

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Clock: B		Zone: 4		Zone Type: Spray	
Current minutes/week: 128		Recommended minutes/week: 30			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	5	15	22.5
June-August	2	3	5	15	30
September	1	3	5	15	15

Clock: C		Zone: 15		Zone Type: Spray	
Current minutes/week: 64		Recommended minutes/week: 30			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	5	15	22
June-August	2	3	5	15	30
September	1	3	5	15	15

Clock: D		Zone: 2		Zone Type: Spray	
Current minutes/week: 60		Recommended minutes/week: 36			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	6	18	17
June-August	2	3	6	18	36
September	1	3	6	18	18

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Clock: D		Zone: 4		Zone Type: Rotor	
Current minutes/week: 120		Recommended minutes/week: 72			
Month	Number of Watering Days Per Week	Number of Cycles	Minutes Per Cycle	Total Minutes Per Watering	Total Minutes Per Week
May	1.5	3	12	36	54
June-August	2	3	12	36	72
September	1	3	12	36	36